

REMARKS

Claims 1-20 and 22 were pending. Claims 5-10, 13 and 14 had been withdrawn from consideration. Support for the amendment are as follows: Claim 1: p.9-10; Claim 15: p.10-11; and Claim 22 lines 1-5 on page 9 of the instant specification. Claims 23-31 have been added. Now pending claims are claims 1-4, 11-12, 15-20 and 22-31. Support for the new claims are found in, e.g., working example section, and range limitation are within the disclosed range. No new matter has been added.

Claims 1, 4, 11-12, and 16-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nowak et al (US 6,503,965) in view of Yamamoto et al (US 6,111,044). (Office Action, page 3)

The Office Action states:

Given that Nowak discloses an ink composition comprising thermosetting results, light of the particular advantages provided by the use and control of the thermosetting resin containing carboxyl groups as taught by Yamamoto, it would therefore have been obvious to one of ordinary skill in the art to include such resins in the composition disclosed by Nowak with a reasonable expectation of success. (Office Action, 3rd paragraph on page 4)

The applicants respectfully disagree.

There are several of reasons why Yamamoto should not be combined with Nowak. First, the general understanding of the word “a carboxyl group” by a person skilled in the art is unblocked carboxyl group. Yamamoto stated drawbacks of using “unblocked” carboxyl group in lines 52-67 in column 1. Yamamoto reached an invention which overcame the drawbacks they identified, resulting in using “blocked” carboxyl group. The carboxyl group of the present invention is “unblocked”, as generally understood by skilled artisan, not “blocked carboxyl acid”, which is, according to Yamamoto, not preferable for its thermosetting compositions. Thus, Yamamoto cannot be combined to achieve the claimed invention. This is also supported by Yamamoto’s Comparative Example 4 where compound A-2 having (unblocked) polycarboxylic acid is used and resulted in unpreferable gelation as shown in Table 14.

Second, when a carboxyl group of a binder resin is blocked carboxylic acid as disclosed in Yamamoto, adhesion of the binder resin to the surface of metal thin film fragments does not occur, and the effects for improving peel strength as disclosed in Examples of the present specification cannot be obtained. If the block agent separates from the carboxylic acid and therefore the binder resin can adhere to the surface of metal thin film fragments, the block agent separated from the binder resin remains in the ink. When such a block agent exists in an ink, problems tend to occur such as unpreferable appearance and poor peel strength due to a foam caused by the block agent, for example, when a laminated sheet is prepared using such an ink. Thus, Yamamoto alone cannot achieve a desired characteristics of the present invention and there is no suggestion that combination with Nowak would result in successful production with the desired characteristics.

Third, what Yamamoto discloses in its working example section is that its composition requires not just one of the listed compounds but all three functional groups selected from a blocked hydroxyl group, a blocked carboxylic acid and an epoxy group as essential groups, in order to achieve the desired result. None of the compounds prepared in the Example section lack one of the three. See Tables 11, 12 and 13. And in column 24, from lines 5, it states that comparative examples which lack one of the listed functional groups have somewhat inferior compared to those having all three. Contrary to Yamamoto, the claimed invention can be achieved by one of the selected compounds.

Fourth, Yamamoto discloses that the coating material of Comparative Example 5, wherein a thermosetting composition has all three of blocked hydroxyl group, blocked carboxylic acid, and an epoxy group, but does not comprise a thermal latent catalyst, gelled after 1 day of storage. Yamamoto reasoned this gelation as "since this material did not comprise the thermal latent catalyst." In other words, for Yamamoto, the thermal latent catalyst is a necessary component to obtain a desired product. Yamamoto further discloses that the thermal latent acid catalyst may preferably exhibit acid catalytic activity at 60°C or higher temperature and if the thermal latent acid catalyst exhibits the acid catalytic activity at a temperature lower than 60°C, the viscosity of the resulting composition will increase during storage and is likely to be gelled. See column 7, lines 40 to 52 of Yamamoto. On the contrary, such limitation regarding the thermal latent acid catalyst is not required in the claimed invention.

Accordingly, even if a person skilled in the art would prepare an ink from Nowak and Yamamoto, resulting ink would contain (i) a thermal latent acid catalyst, and (ii) one or more resins, wherein the combination of a blocked hydroxyl group, blocked carboxylic acid and an epoxy group exist in the resins. Such an ink is chemically different from the ink of the claimed invention in at least the aspects describe above, and thus cannot show unexpected excellent effect. The combined teachings or suggestions of Nowak and Yamamoto do not achieve the claimed invention in claim 1 as a whole.

As to claims 4, 11-12, 16-17, since claim 1 is taught away by Yamamoto and thus not obvious from the combination of Nowak and Yamamoto, these claims are also not obvious from the combined references. Thus it is respectfully requested that the rejection be reconsidered and withdrawn.

Claims 2-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nowak et al (US 6,503,965) and Yamamoto et al (US 6,111,044) as applied to claims 1, 4, 11-12, and 16-17 above, and in view of Molloy et al (US 6,476,096). (Office Action, page 7)

As stated above, since Yamamoto cannot be combined with Nowak, even if Molloy is combined with Nowak, combination of all three would not achieve the claimed invention.

In addition, the applicants would like to bring the Examiner's attention to the statement on the interpretation of the data in paragraphs 13 and 14 on pages 16-17 of the Office Action. The Examiner admitted that there are unexpected results of ink composition comprising acid anhydride, yet concluded "these examples do not disclose amounts of acid anhydride over the entire claimed range of 0.01 to 30 wt%" in paragraph 14 on page 16 of the Office Action. It appears that the Examiner reads Inks 2-A and 2-B comprises 37.5 wt% and 28 wt% acid anhydride; but the number should be read as 6.3% and 0.37%, respectively, since the wt % is "wt% by mass of an acid anhydride moiety...based on the metal thin film fragment." 37.5 wt% and 28 wt% are for acid anhydride moiety, not based on aluminum thin film fragments. See lines 5-3 from the bottom on page 23 and lines 1-3 on page 24 of the instant specification. Thus, these numbers of 6.3 and 0.37 together with 18.3% in Ink 1-A in line 1 from the bottom on page 22 of the specification are well scattered within the range to support the claimed range.

Claims 15 and 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nowak et al (US 6,503,965) in view of Yamamoto et al (US 6,111,044) and Molloy et al (US 6,476,096). (Office Action, page 7)

As stated above, Yamamoto cannot be combined with Nowak, and thus even if Molloy is combined with Nowak, combination of all three would not achieve the claimed invention. It is respectfully requested that the rejection be reconsidered and withdrawn.

Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nowak et al (US 6,503,965). (Office Action, page 12)

Claim 22 has been clarified to have the following feature: An ink comprising: metal thin film fragments having an average thickness of 0.01 to 0.08 μm and an average particle diameter of 5 to 25 μm ; and a binder resin having 50 to 500 mmol/kg of an amino group. There is no overlapping range with Nowak and thus not obvious from Nowak. It is respectfully requested that the rejection be reconsidered and withdrawn.

Newly Added Claims

Claims 23 and 28 clarify that the carboxyl group used in the present invention is not a blocked carboxyl group. As stated above, general understanding of the skilled artisan is "unblocked" group (and thus Yamamoto explicitly added "blocked" in the specification). Thus, there is no new matter added.

Claims 25 to 27 and 30 to 32 do not overlap with the disclosure of Nowak and/or Yamamoto. Moreover, Yamamoto discloses "[i]f the concentration of the functional group is less than 0.5 mol/kg, a cured film having sufficient cross-linking density cannot be obtained, and chemical resistance such as acid resistance, physical properties such as abrasion resistance, and weatherability of the film become poor, thus being not preferred" in Column 6, lines 60 to 68, and Column 7, lines 1 and 2 thereof. Yamamoto teaches away from these claims.

Claims 24 and 29 do not overlap with the disclosure of Nowak, and thus are deemed patentable.

(v) Items 9 to 14 of the Office Action

Regarding incorrect terms

There are incorrect terms, used by mistake, in the descriptions of the 37 C.F.R. 1.132 Declaration filed on November 15, 2010, as follows: "The content of a functional group (carboxyl group) in the solid resin content was 310 mmol/kg (calculated value)" on page 3 of the Declaration is the description for the Preparation Example 2, and therefore is incorrectly described. Furthermore, "500 mmol/g" on page 3 of the declaration, which is used for explaining Preparation Example 3, but is not shown in the Table of the Declaration, should be described as "500 mmol/kg". "417 g" and "306 g" shown in Table as the content of a functional group (mmol/kg) should be described merely as "417" and "306".

In view of the above amendment, applicant believes the pending application is in condition for allowance.

The Director is hereby authorized to charge any deficiency in the fees filed, asserted to be filed or which should have been filed herewith (or with any paper hereafter filed in this application by this firm) to our Deposit Account No. 04-1105.

Dated: August 15, 2011

Customer No. 21874

Respectfully submitted,

Electronic signature: /James E. Armstrong, IV/
James E. Armstrong, IV
Registration No.: 42,266
EDWARDS ANGELL PALMER & DODGE
LLP
P.O. Box 55874
Boston, Massachusetts 02205
(202) 478-7375
Attorneys/Agents For Applicant